

User's Manual

Butt-welding Machine for Workshop Applications

CNC 2000 ECO-W



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1 Introduction

Dear Customer:

Thank you very much for purchasing our product. We are confident that it will meet your expectations and hope that it will contribute to your professional success.

The development, manufacture, and check of the heating element butt-welding machine has been guided by our concern to offer a device characterized by superior operation safety and user-friendliness. The device was manufactured and checked according to state-of-the-art technology and widely recognized safety regulations.

To ensure maximum operation safety, please conform to the appropriate messages in this booklet and the regulations for the prevention of accidents.

This manual is applicable to the following machines:

CNC 2000 ECO-w

Thank you.

2 Safety Instructions

This User's Manual contains important instructions for operating safely the heating element butt-welding machines Hürner CNC 2000 ECO-w. Every person who operates the machines will first have to read this Manual.

2.1 The User's Manual

The User's Manual is presented according to sections, which explain the different functions of the machines. All rights, in particular the right to copy and distribute as well as to translate, are reserved. The copy or reproduction (in print or electronic form) is subject to the prior written authorization by HÜRNER Schweisstechnik, Mücke, Germany.

2.2 Explaining Icons

The following expressions and icons are used in this User's Manual to refer to safety-related issues:



Caution

This icon indicates that non-compliance may result in a hazardous situation that possibly causes bodily injury or material damage.



Important

This icon indicates important messages related to the correct use of the machine. Non-compliance may cause problems of operation and damage to the machine.



Info

This icon indicates tips and useful information for using the machine more efficiently and more economically.

2.5 Safety Messages

Protect the power supply cord and the pressure lines from cutting edges. Have an authorized service shop replace damaged cables or lines immediately.

- The device may be operated and serviced exclusively by authorized staff who have been trained on it.

- The machine may be operated only when observed.
- Before operating the machine, always check for damaged parts and have them repair or replace by an authorized service shop as needed.
- The protective caps on the interface and the pressure lines have to be in place during transport so as to prevent contaminants and humidity from entering the machine.
- EVU wiring regulations, VDE provisions, DIN / CE regulations, and national laws will have to be respected.
- Without prior authorization by the manufacturer, no modifications may be made to the device.



Caution

Parts Under Power

After opening the machine or removing the cover, parts of it are accessible that may be under power. The device may be opened exclusively by an authorized service shop.



Caution

Pipe Facing Tool

Start the pipe facing tool only when it is in its working position; protect the facing surfaces from dirt and damage.

It is forbidden to remove shaving from the machine while the facing process is still running. Make sure nobody is present in this danger zone.



Caution

Heating Plate

When working with the machine, be extremely cautious while the heating plate is used. Since the heating plate presents a temperature of more than 200°C during the welding process, it is absolutely necessary that operators wear suitable protective gloves. Please note that the heating plate will remain hot for a while after it was turned off.



Caution

Danger of Bruises and Injury

Do not remain in the danger zone while the machine opens or closes and be sure not to have you arms or hands between the moving and the fixed trolley of the machine.



Caution

Acceptable Work Conditions

The work zone has to be clean and has to have proper lighting. It is dangerous to operate in a humid environment or close to inflammable liquids. In regard of this, acceptable work conditions have to be ensured (e.g., sufficient distance between the machine and other functional areas of the workshop).



Info

User's Manual

The User's Manual has to be available at any time on the site where the machine is used. If the User's Manual should come to be incomplete or illegible replace it without delay. Feel free to contact us for assistance.

2.4 Warranty

Warranty claims may be raised only if the conditions for warranty given in the General Terms and Conditions of Sale and Shipment obtain. Furthermore, the conditions contained in the User's Manual have to obtain.

2.5 Service and Repair

As the machine is used in applications that are sensitive to safety considerations, it may be serviced and repaired only on our premises or by subcontractors and partners who have been specifically trained and authorized by us. Thus, constantly high standards of operation quality and safety are maintained.



Non-compliance with this provision will dispense the manufacturer from any warranty and liability claims for the machine and any consequential damage.

2.6 Transport / Storage / Shipment

The machine is shipped on a palette. When loading or unloading the machine, ensure it is not tipped excessively. During transport, the pipe facing tool and the heating element have to be in the working position and to be secured properly in order to prevent them from tilting up.

2.7 Identifying the Machine

Each machine is identified by a name plate. It shows the machine model ("Typ"), the serial number ("Maschinennr."), and the manufacturer. The first two digits of the serial number represent the year of manufacture.

Stumpfschweißmaschine	
Typ	CNC 2000 ECO-w
Maschinennr.	05441019
Hürner Schweisstechnik	
Nieder-Ohmener Str.	
D - 35325 Mücke	
Tel. +49 6401 9127 0	
CE	

3 Understanding the Machine

The machine is a butt-welding machine for plastics, which has basically three functions:

- Controlling the welding process;
- Monitoring all the relevant parameters during the welding process;
- Generating a report summarizing the welding process.

The machine can be used both as on-site and as in-shop installation. Upon entering the type of plastic, the pipe diameter, and the wall thickness, the machine calculates all the parameters that are critical for the welding process, taking into account the applicable national welding standards (DVS, INSTA). The entire welding process is automatically controlled, monitored, and saved to a report. The saved welding data can subsequently be transferred directly to a printer or to a PC with DataWork / DataWork GIS installed.

The pipe and traceability data needed can be entered using both the film-protected alphanumeric keypad and a barcode scanning wand.

For various applications, the machine can be specifically configured in the Configuration Menu (see section 4.2 "Configuring the Machine").

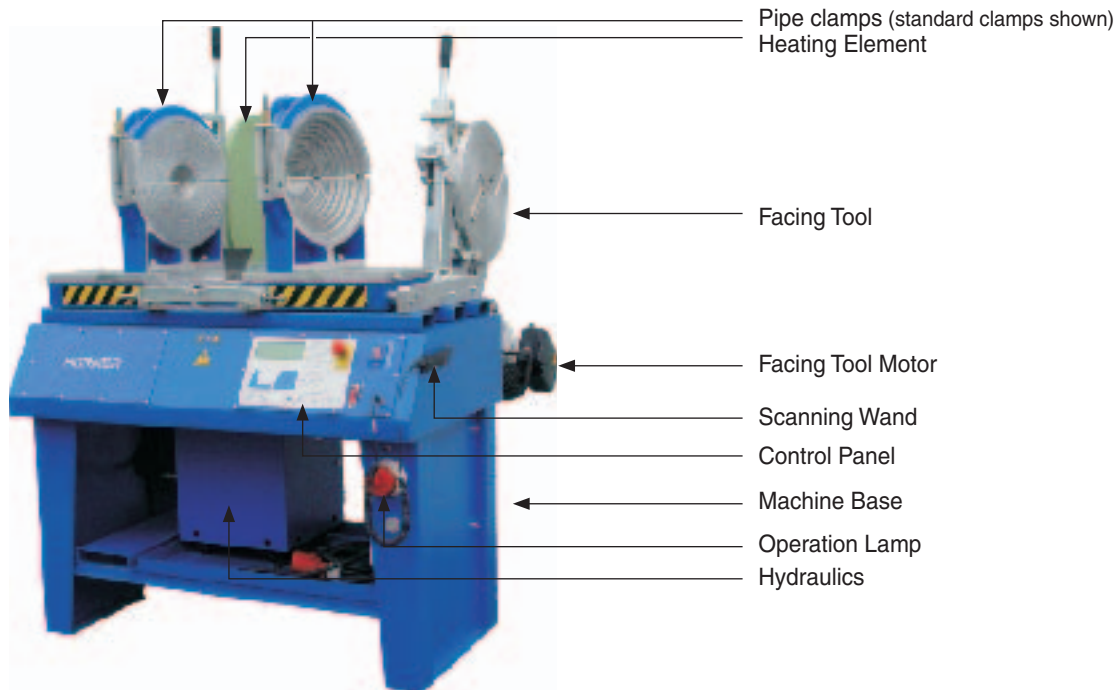
The welder performs the welding process in the following manner:

- Pipes are clamped into the frame; if welding elbows, Tees or Ys only after cutting the pipes for construction.
- Pipe ends are worked using the pipe facing tool.
- Pipe alignment is checked following the information on the display.
- The heating element is inserted after cleaning it and checking the temperature.
- After the heating element was inserted, the pipes close in automatically at the predefined build-up pressure.
- During the build-up phase the weld bead builds up.
- The machine then moves on automatically to the heat-soaking phase.
- After the heat-soaking phase, the machine automatically moves the trolleys apart and the welder can remove the heating element.

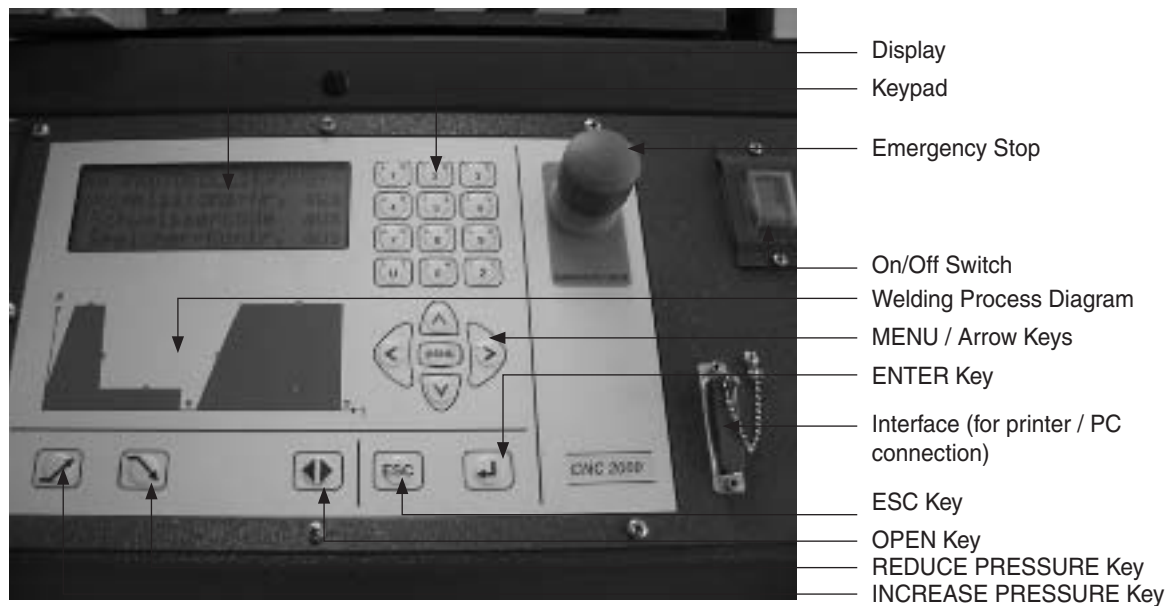
- After the heating element was removed, the machine automatically joins the pipes together.
- This is followed by a steady pressure increase until the fusion pressure is reached.
- The pipe then cools down at the predefined pressure.
- After the cooling time is over, pressure is automatically removed from the pipe and the pipe can be taken out of the frame.

3.1 Machine Components

3.1.1 Component Overview



3.1.2 Control Panel Components



3.1.3 Emergency Stop Switch on the Control Panel

An Emergency Stop push button is provided on the control panel for interrupting the welding process, if needed, to prevent hazardous situations. If the

Emergency Stop button is pressed, it disables the power supply to the facing tool, the heating element, and the hydraulics. Power is further supplied to the micro-controller board (the display screen keeps working).



When it was pressed, the Emergency Stop push button remains locked. When the hazard is cleared, the button has to be unlocked by turning it clockwise. It is also possible to move the trolley on the frame manually.

3.2 Technical Specs

Hürner CNC 2000 ECO-w	
Power Characteristics	
Voltage	230 V
Frequency	50 Hz
Total Rated Power	5.5 kW, 30 A
Heating Element	3.7 kW
Facing Tool	1.5 kW
Hydraulics	0.74 kW
Protection	
Heating Element	IP54
Facing Tool	IP44
Hydraulics	IP44
Operating Range	90 - 315 mm
Hydraulic Characteristics	
Operating Pressure max.	110 bar
Cylinder	6.47 m ²
Ambient Temperature	-5°C bis +50°C
Hydraulic Oil	HLP 32
Dimensions and Weight	
Total Machine Dimensions	1220 x 900 x 1500 mm
Weight	250 kg
Maximum Trolley Stroke	210 mm

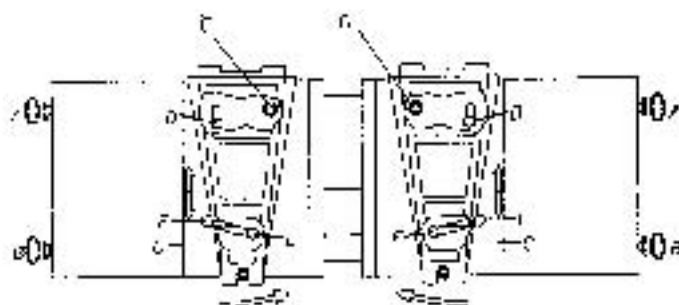
3.3 Preparing to Weld Pipes and Fittings

Depending on the type of welding operation, the standard clamps mounted on the trolleys of the butt-welding machine may have to be replaced by Tee elements or Y elements.

3.3.1 Welding Elbows from Pipe Segments

Using the standard pipe clamps, it is possible to weld elbows of up to 45° from segments of pipe. The standard clamps are secured to the support panel on the trolley of the machine using bolts G, D, and E (see Diagram 1).

To weld an elbow from segments, loosen bolts G, D, and E and tip the clamp fronts toward each other around the pivoting point G. Bolts D and E will remain in the slots prepared for this operation. To place the clamps in the correct po-



- A Fixation Bolts of the Support Panel
- B Fixation Bolts of the Support Panel
- C Support Panel
- D Fixation Bolts of the Pipe Clamp
- E Fixation Bolts of the Pipe Clamp
- F Angle Scale
- G Fixation Bolts of the Pipe Clamp (pivoting point)

Diagram 1

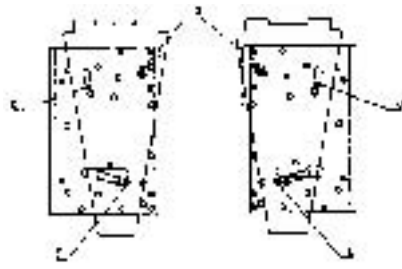


Diagram 2

sition for the intended angle, use the angle scale F for orientation.

To weld elbows up to 30° place D and E as shown in Diagram 2, to weld elbows larger than 30°, as shown in Diagram 3.

After the machine was prepared, welding proper proceeds as explained in section 4. Diagram 4 shows an elbow welded from several segments of pipe with several welding operations.

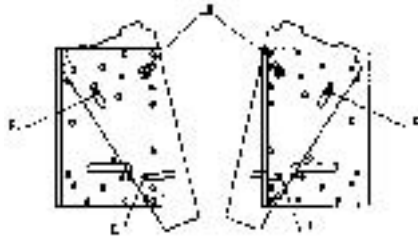


Diagram 3

3.3.2 Welding Ys with a 60° Angle

To weld Ys, replace the standard pipe clamps with the Y clamp elements. Remove bolts G, D, and E and take the standard clamps from the machine trolleys. This allows free access to the

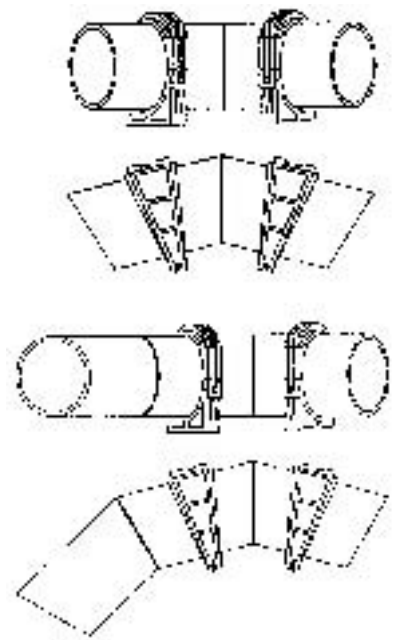


Diagram 4

support panels (see Diagram 5). Welding a Y will require that two welds will be performed.

Start by welding the 60° angle in the Y. To do so, place Y element Z on the left-hand support panel and Y element W on the right-hand support panel. Make sure that for securing the Y clamp element to the trolley, holes A, F, and H of the base (see Diagram 10) of element Z align with holes 6, 8, and 13 of

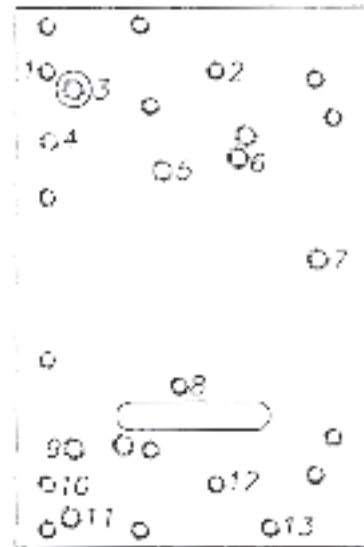
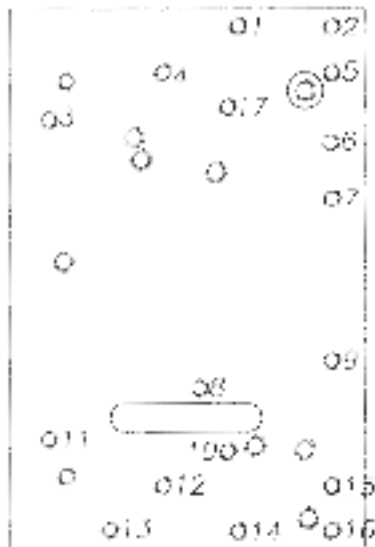
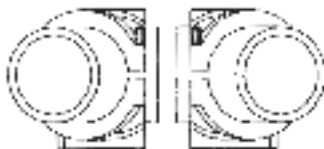


Diagram 5



the left-hand support panel. Holes A, F, and H of the base of element W have to align with holes 4, 8, and 13 of the right-hand support panel (see Diagram 6).

After the machine was prepared, welding proper proceeds as explained in sec-

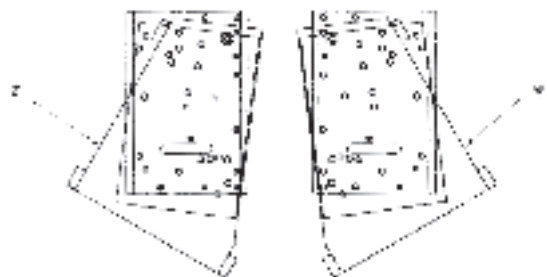


Diagram 6

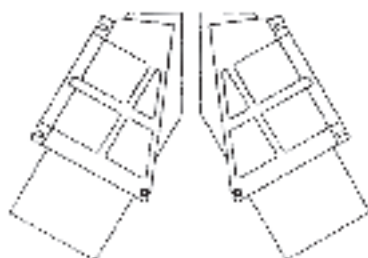


Diagram 7

tion 4. Diagram 7 shows a 60° angle in a Y that was welded as described above.

The second weld that needs to be performed will connect the angle just welded to the straight pipe in the Y. This requires placing both Y clamp elements onto the left-hand support panel (see Diagram 8). For securing them to the trolley, align holes C, D, and G of Y element Z with holes 1, 17, 3 of the support panel. Align holes C, D, and G of the base of Y element W with holes 10, 14, and 11 of the support panel. Then place the standard pipe clamp on the right-hand support panel, secure it to holes 5, 7, and 11, and tip its front toward the centerline as far as possible.

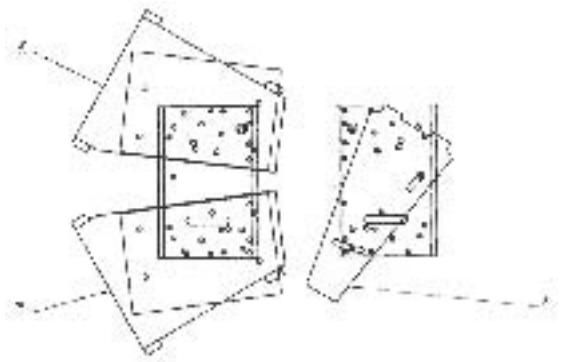


Diagram 8

After the machine was prepared, welding proper proceeds as explained in section 4. Diagram 9 shows a Y with a 60° angle that was welded as described above.

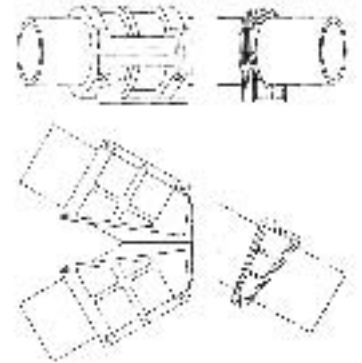


Diagram 9

3.3.3 Welding Ys with a 45° Angle

To weld a Y with a 45° angle, the procedure is analogous to welding a 60°-angled Y (see section 3.3.2): First, the 45° angle is welded, then the straight pipe is connected to this angle.

Start by removing the standard pipe clamps from the support panel and mount the Y clamp elements. Here, too, make sure that the holes in the base of the Y elements (see Diagram 10) are aligned with the proper holes of the support panel (see Diagram 5) for securing the clamps to the trolleys.

The holes B, A, H, and I of the base of Y element Z have to be aligned with the holes 4, 5, 12, 15 of the left-hand support panel, and the holes B, A, H, and I of the base of Y element W have to be aligned with the holes 1, 2, 12, 10 of the right-hand support panel (see Diagram 11).

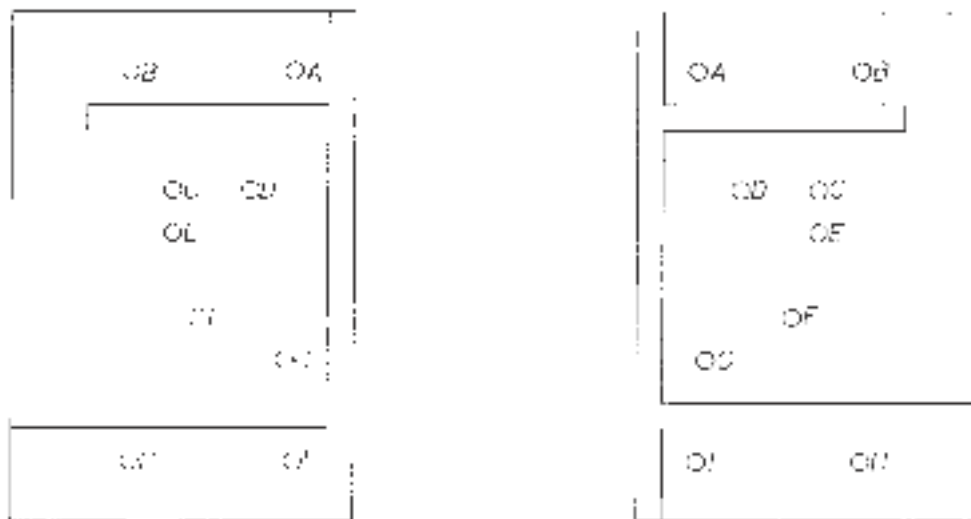


Diagram 10

For the first welding operation for making a Y with a 45° angle, cut the pipes as shown in Diagram 12. Leave 10 mm more length than needed at the centerline, where the pipes face each other. This extra length will be removed by facing before the second welding.

The second welding operation is also performed analogous to a Y with a 60° angle: place both Y clamp elements onto the left-hand support panel and place one standard clamp onto the right-hand support panel (see Diagram 13). Make sure that the holes E, B, and A of the base of Y element Z align with the holes 4, 2, and 7 of the left-hand support panel, and the holes A, B, and E of the

base of Y elements W align with the holes 9, 6, and 12 of the left-hand support panel. The standard pipe clamp for welding elbows has to be placed onto the right-hand support panel in such a way that the angle scale shows 45° (see Diagram 1).

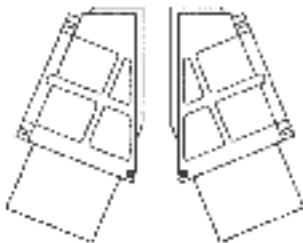
After the machine was prepared in both cases, the welding operations proper proceed as explained in section 4. Diagram 14 shows a Y with a 45° angle welded as described above, after the first and after the second welding operation.



Diagram 12

3.3.4 Welding right-angles Tees

To weld Tees, replace the standard pipe clamps with the Tee elements. Remove bolts G, D, and E and take the standard clamps from the the



machine trolleys. This allows free access to the support panels (see Diagram 5). Welding a Tee will require that two welds will be performed.

Start the operation by welding the 90° elbow. To do so, place the Tee element intended for the left-hand side on the left-hand support panel and make sure that for securing the Tee clamp element to the trolley, holes A, B, C, and D of the base of the Tee element (see Diagram 15) align with holes 4, 5, 12, and 15 of the left-hand support panel. Holes A, B, C, and D of the base of the Tee element intended for the right-hand side have to align with holes 1, 2, 10, and 12 of the right-hand support panel.

After the machine was prepared, welding proper proceeds as explained in section 4. Diagram 17 shows a 90° elbow, first welding for a Tee, that was welded as described above.

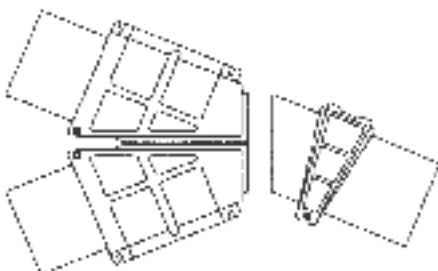
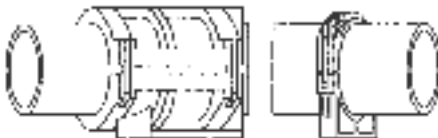


Diagram 14

After the first welding operation, the 90° elbow is cut, placed into the Tee clamp element and connected to the straight pipe by using the same welding procedure. Diagram 18 shows a Tee welded as described above, after the second welding operation.

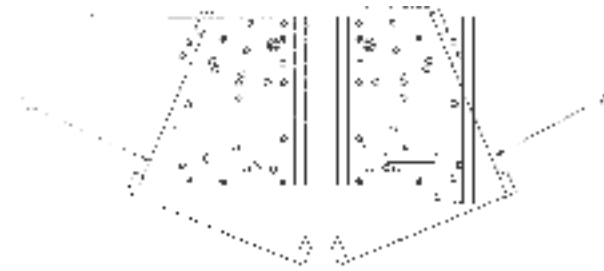


Diagram 11

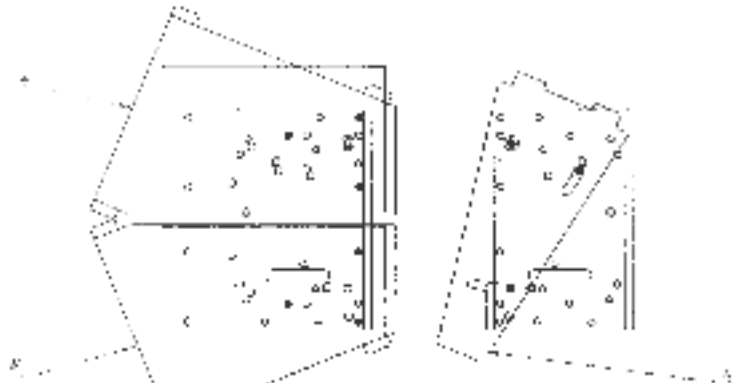


Diagram 13

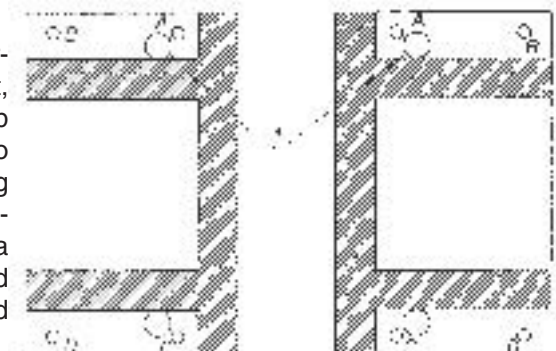


Diagram 15

3.3.5 Welding Crosses

In principle, the procedure for welding crosses is analogous to welding Tees (see section 3.3.4). However, three welding operations will be needed in this case. After the standard pipe clamps were replaced with the Tee clamp elements,

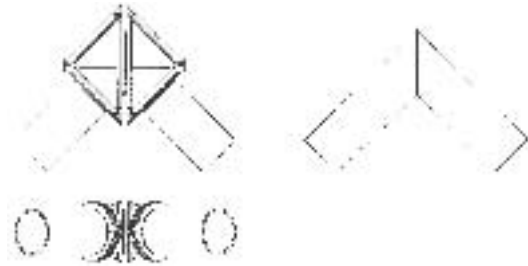


Diagram 17

the first two steps of this kind of welding consist of welding two 90° elbows.

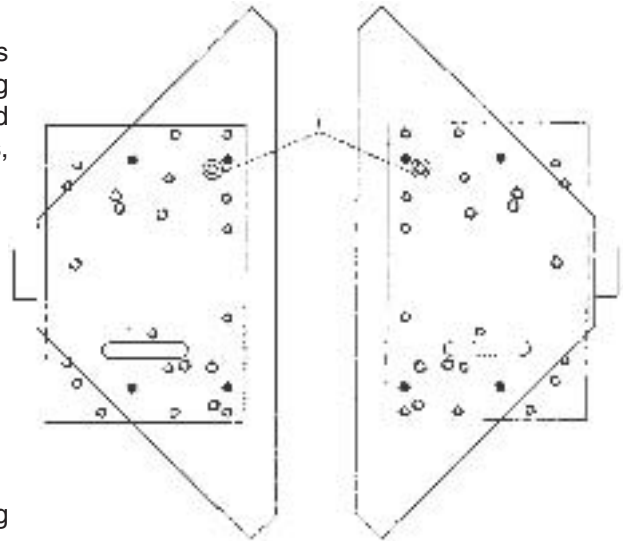


Diagram 16

Then, both elbows will be cut along the outer angle to face each other and will be placed in this state into the Tee clamp elements. The third and last welding then forms a cross out of the two elbows.

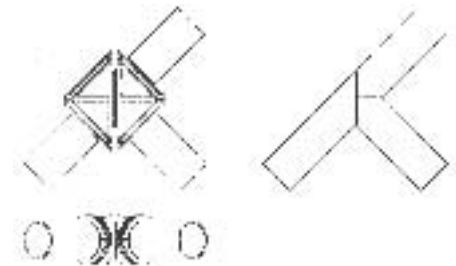


Diagram 18

4 Operation

4.1 Check-out, Turning the Machine On



Important

Before the control unit is turned on, check the oil level of the hydraulics and fill up HLP 32 hydraulic oil as needed.



Important

The surfaces of the heating plate have to be free of grease and clean, or they have to be cleaned.



Important

Make sure all connectors are tight in their sockets and make sure that the machine is operated only if the conditions for safe and intended use are met (see also section 2).

After connecting the power supply cable to the mains power supply, the machine is turned on using the On/Off switch. It is possible that the main switch located on the mounting box inside the right-hand leg of the machine has to be turned into the On position to have the machine under power.

4.2 Default Configuration of the Machine and the Set-up Menu

Display 2 shows the report number number (before the slash) and the weld number (after the slash) that will be attributed to the next welding operation. The weld number, which identifies the incremented number of weld, e.g. of a given commission, shows only if this function has been enabled in the Configuration Menu.



Info

To bring the machine in the open or the closed position (trolley moved apart or closed in) when no welding procedure is running, use the OPEN and the INCREASE PRESSURE keys.

```
xxxxxx HUERNER xxxxx
x  CNC 2000 ECO-W  x
x  Version 1.05PD  x
xxxxxxxxxxxxxxxxxxxx
```

Display 1

```
Next Welding
Time       : 10:32
Date       : 08.03.05
Prot. No.  : 0014/0005
```

Display 2

The Configuration Menu is accessible by pressing the MENU key when Display 2 shows on the screen.

When the operator presses the MENU key, the screen asks to enter a selection code (see Display 3). This is an access code that authorizes the operator to select and change machine parameters in the appropriate configuration menus. The selection code can be entered using both the keypad and the scanning wand to read the operator code.

Enter Select Code
+++++

Display 3



After entering an incorrect code three times, the machine returns automatically to the ready-to-weld screen (Display 2). If the access code for selecting and changing values that was entered is correct, the Configuration Menu shows on the screen, as in Display 4.

CONFIGURATION SELECTION CODE:

415311

In the Configuration Menu use the UP and DOWN arrow keys to select a specific configuration option. The option can then be set to On or Off using the RIGHT arrow key. The –M– displayed for the *Set Clock*, *Choose Language*, and *Guideline* options indicates that a sub-menu can be accessed by pressing the MENU key.

REPORTS
>Commissions No. on
Welder Code on
Memory Contr. on

Display 4



When you press the ENTER key, the settings will be saved and applied. Press ESC to quit the configuration menu without saving any modifications.

The Configuration Menu contains the options listed in the table below.

Description	Setting	Data to be entered
Commission Number	ON / OFF	To be entered before every welding, 32 alphanumeric characters
Welder ID Code	ON / OFF	To be entered before every welding, ISO welder identification code
Memory Control	ON / OFF	if ON: Machine stops when the memory is full if OFF: Machine overwrites the oldest report when the memory is full
Weld Number	ON / OFF	To be entered before the first welding, machine increments by 1 for each subsequent weld
Additional Data	ON / OFF	To be entered before every welding, 20 alphanumeric characters
Monitor Ambient Temperature	ON / OFF	if ON: Ambient temperature will be checked when machine is turned on if OFF: No check of ambient temperature <i>If the ambient temperature is below 0°C, no welding process should be started, or suitable steps should be taken.</i>
Manual Input	ON / OFF	if ON: It is possible to change the welding parameters manually; if OFF: manual change of welding parameters impossible
Automode	ON / OFF	if ON: Build-up time included in the control software is used, the build-up phase will be ended automatically; if OFF: the build-up phase has to be ended manually by pressing the ENTER key
Guideline	— M —	Selecting the welding standard (sub-menu)
Set Clock	— M —	Setting the time of day and date (sub-menu)
Choose Language	— M —	Setting the display/printer language (sub-menu)

5.10 Entering Applicable Welding Parameters

After having entered – if enabled – the traceability data, such as Commission Number, Welder ID Code, etc., you can start entering the welding data proper, or you can use the parameters from the preceding weld.

After it was turned on, the machine goes on from Display 2 to Display 5 when you press the ENTER key. To keep the all displayed welding parameters for the following welding, press the ENTER key, the welding will start immediately.

If data have to be changed for the next welding, press ESC. The first step consists of selecting the appropriate pipe material using the UP/DOWN cursor keys (see Display 6). Use the ENTER key to confirm you selection of the pipe material. The machine goes on automatically to the next menu item, entering the pipe dimesions.

This screen (see Display 7) asks the welder to enter the diameter, the wall thickness or the standard dimension ratio (SDR) of the pipe that is going to be welded. This is done moving the cursor character by character and into the next line using the RIGHT arrow key. To be able to enter the SDR, first press the DOWN arrow key when they cursor is in the *Wall thickness* line. To apply the values entered, press the ENTER key.

Finally, the type of welding is also part of the welding parameters (see Display 9). Here, too, use the UP and DOWN arrow keys to select the kind of welding that is going to be performed, and confirm your selection by pressing the ENTER key. The available options are *Straight welding*, *Elbow welding*, *T Element*, *Y 45° Element*, *Y 60° Element*, and *Cross*.

If a Y element welding is selected in this menu, the welder has to specify furthermore if the welding is the first or the second for making this Y (see Display 10).

If a elbow welded from pipe segments is selected, the angle the elbow is going to have has to be entered (see Display 11).



Important

When entering the angle to be welded, enter the full angle in degrees that the elbow should have; do not enter half the angle value. The standard pipe clamps of the machine, too, have to be aligned with the full angle value on the scale on the support panels rather than with half the intended value.



Info

See section 3.3 for a detailed overview on how to prepare the machine for welding elbows, Tees, Ys and crosses.

Using the entered parameters on pipe material, pipe dimension, and type of welding, the machine calculates the required pressures, welding phase duration, and the temperature of the heating element. After you have entered the parameters, they are displayed once again for verification. The data shown can still be changed by pressing the UP arrow key to go back one step at a time and access the screen in question. Confirm these values by pressing ENTER in order to go on to the welding process proper.

4.4 Welding Process

Before you start welding, the machine has to be prepared for the intended type of welding. If necessary, the standard pipe clamps have to be adjusted to the correct angle scale on the support panels, or they have to be replaced with the Tee element or Y elements. See section 3.3 to learn how the special elements are placed onto the support panels and adjusted.

Pipe material: PE80
Pipe diameter:0250mm
Wallthickness:22.7mm
Straight welding

Display 5

SELECT PIPE MATERIAL
>PE80
PE100
PP

Display 6

ENTER PIPE DIMENSION

Pipe diameter:0250mm
Wallthickness:22.7mm

Display 7

ENTER PIPE DIMENSION

Pipe diameter:0250mm
SDR : 9.0

Display 8

SELECT WELDING TYPE
>Straight Welding
Elbow Welding
T Element

Display 9

Y 45° ELEMENT
>1. Welding
2. Welding

Display 10

ENTER ANGLE

Angle : 30 °

Display 11

After the machine was prepared, the welding parameters for the following weld were entered (see section 4.3) and confirmed by pressing the ENTER key, the machine starts the welding process by facing the pipe ends (see Display 12).

4.4.1 Facing the Pipe Ends

To ensure the pipe ends are level, insert the pipe facing tool into the machine. Clicking its handle into place in its working position turns it on automatically. The machine will then bring the pipes to the facing tool at the predefined pressure. Use the INCREASE PRESSURE and REDUCE PRESSURE keys to adjust the pressure during facing manually.

Pipe facing should continue until shaving forms a continuous blade that rolls twice or three times around the pipe ends, so the butts are level. Facing is stopped by pressing the ENTER key. The machine automatically retracts the pipes.

If you discover after the facing process that the butts are still not level, start over, open the machine completely, insert the facing tool, thereby launching pipe facing automatically. When facing is properly done, pipe alignment has to be checked.

4.4.2 Checking Pipe Alignment

Press the ENTER key to have the machine place the pipes together automatically. On the screen (Display 13), the maximum acceptable alignment gap between the pipes is shown. If the pipes align properly, this has to be confirmed by pressing the ENTER key.

If the gap is too large, re-adjust the pipes in the clamps and start the facing process again as needed. To do so, place the machine in the open position first using the OPEN key. Then insert the facing tool, launching the facing process by clicking the handle into place in its working position. You can abort the welding process by pressing ESC.

4.4.3 Changing Welding Parameters

When pipe alignment was checked, the machine moves on automatically to Display 14 if the Manual Input option is enabled in the Configuration Menu. In Display 14, the welder can keep the welding parameters from the last weld by pressing the ENTER key or he can adjust them to his specific purposes by pressing the ESC key (see Display 15).

If the parameters for the next welding process are entered manually, the UP and DOWN arrow keys are used to select the line the is to be changed, and the new value is typed on the keypad. The parameters are saved and applied by pressing the ENTER key; the machine moves on from Display 15 to Display 16 or from Display 16 back to the welding process.



Important

The parameters set manually are kept in memory when the machine is turned off. Only the pressure values are calculated individually for each welding process. If the pipe dimensions change, **all** parameters have to be set once again. The machine recognizes the change of dimension and leads the operator directly to the menu that allows changing the parameters.

4.4.4 Inserting and Monitoring the Heating Element

The machine controls and monitors constantly the temperature of the heating element. If the temperature is not within the tolerance thresholds, the machine shows an error message to this effect in the first line of the display. Furthermore, the upper and lower thresholds of the tolerance range are indicated in the fourth line along with the current actual temperature (see Display 17).

Facing pipe ends

Display 12

Check pipe alignment
Max. gap : 2.5mm

Display 13

Do you want to use
data of previous
welding?
ESC <-

Display 14

Heating pr.:030.5bar
Heatsoakpr.:010.5bar
Heat soak :0120 s
Change-over:0005 s

Display 15

Cool. time :0900 s
Pr. build-up:0010 s
Heat. temp. :0223 °C

Display 16

Plate temp. too low

222°C < 210 °C < 232°C

Display 17

As soon as the nominal temperature is reached, Display 18 shows.

By inserting the heating element, you make the machine move on to the Build-up Phase. At this time, the pipes are placed together automatically and the calculated pressure during bead build-up is applied.

4.4.5 Bead Build-up Phase

During the Build-up Phase LED 1 flashes to indicate the progress of the welding process. As soon as the build-up pressure is achieved, as shown in Display 19, the display indicates both the maximum bead height and the time so far used for build-up. During this phase, the build-up pressure and the heating element temperature are constantly monitored.

When the bead height indicated on the display is reached, the operator has to press the ENTER key to terminate the Build-up Phase. The machine then continues automatically to the Heat Soaking Phase.

As long as the nominal pressure of the Heat Soaking Phase is not reached yet, LED 2 flashes while LED 1 is steadily lit. The machine reduces pressure automatically.



Important If the Automode option is enabled in the Configuration Menu, the Build-up Phase will be terminated automatically at the end of the bead build-up time included in the control software. If this is not the case, the end of the Build-up Phase has to be confirmed manually.

4.4.6 Heat Soaking Phase

The time for soaking heat is displayed as a countdown showing the remaining seconds (see Display 20). A signal is audible during the final 10 seconds of heat soak immediately before the change-over. During the Heat Soaking Phase LED 3 flashes; LED 1 and LED 2 are steadily lit.

During this phase, the pressure applied while the pipes soak the heat from the plate and the plate temperature are constantly monitored and controlled.

4.4.7 Change-over Phase

After the full heat soaking time, the pipes retract automatically. The heating element has to be removed as fast as possible (see Display 21). During the Change-over Phase LED 4 flashes; all previous LEDs are steadily lit.

The machine then places the pipes automatically together again.

4.4.8 Joining Phase

In the Joining Phase the machine increases pressure in accordance with the pressure ramp calculated for the weld (see Display 22). During this phase LED 5 flashes; all previous LEDs are steadily lit.

4.4.9 Cooling Phase

When the full joining pressure is reached, the machine moves on automatically to the Cooling Phase (see Display 23). The cooling-down is displayed as a countdown. During cooling, the joining pressure applied is constantly monitored. During this phase, LED 6 flashes, all the previous LEDs are steadily lit.

4.4.10 End of Welding

A double buzz indicates that the cooling time has ended. Furthermore, the green LED is steadily lit to indicate a successful welding process. Confirm the

Put in heat. plate

222°C	NOM.	16.5bar
221°C	ACT.	0.5bar

Display 18

Bead height	:2.0mm
Bead buildtime	:68 s
230°C	NOM. 16.5bar
229°C	ACT. 2.5bar

Display 19

HEAT SOAK PHASE		
Heatsoak time	:168 s	
230°C	NOM.	16.2bar
229°C	ACT.	3.2bar

Display 20

Remove plate		
Change-over	: 8 s	
230°C	NOM.	16.5bar
229°C	ACT.	3.5bar

Display 21

JOINING PHASE		
230°C	NOM.	16.5bar
229°C	ACT.	3.5bar

Display 22

COOLING PHASE		
Cooling time over		
229°C	ACT.	0.0bar

Display 23

end of welding be pressing the ENTER key. Pressure will then be switched off from the machine.

4.5 Welding Aborted

All welding-relevant data are constantly monitored while the welding process is running. If one or more of the parameters are out of tolerance and cannot be controlled to adjust, the welding process is aborted after a given period of time.

In these cases the error that made the welding process abort is displayed (see Display 25). In addition, the corresponding LED flashes. The error message has to be confirmed by pressing the ENTER key.

The errors listed in the following table are recognized and displayed on the screen.

WELDING STOPPED Error Build-up pres.		
229°C	ACT.	1.5bar

Display 24

Type of Error	Description
a. Data Input	
Input Error	Erroneous parameter input
b. System	
Clock Defective	Internal clock of the machine is defective; use the Cnfiguration Menu to reset the clock
Pressure Sensor defective	Pressure sensor defective
Heating Sensor defective	Heating element not connected, check connector/socket
Temperature Sensor defective	Ambient temperature sensor is defective
c. Welding Process	
Temperature low	Heating element temperature will be increased automatically
Temperature high	Heating element temperature will be reduced automatically
Error Changeover	It took too long to retract the mirror and bring the pipes to joining; welding will have to be repeated
Ambient Temperature high	Ambient temperature outside the range from 0°C to 50°C
Ambient Temperature low	Ambient temperature outside the range from 0°C to 50°C
Error Drag Pressure	Impossible to determine the drag pressure; maybe pipes will have to be clamped once again
Error Build-up Pressure	Calculated maximum pressure too high; impossible to start welding; maybe pipes will have to be clamped once again
Error Heat Soak Pressure	Heat soaking pressure too high; impossible to re-adjust
Error Joining Pressure	Joining pressure too high or too low; impossible to re-adjust
Cooling Stopped	Operator has stopped the cooling time by pressing the ESC key
Power Supply Failure	In the course of the last welding a power supply failure occurred; welding has to be repeated
Error Plate Temperature	Plate temperature is out of tolerance; impossible to re-adjust the temperature; maybe the ambient temperature was too low

5 Printing Welding Reports

The machine is equipped with a dual interface that gives you the opportunity to connect a common PC printer directly to it or to export the data via a RS232 cable to a PC with DataWork or DataWork GIS installed.

Technical Specs of the Interface:

- Parallel + Centronics
 - Serial + RS232
- | | |
|-------------------|--------------|
| Baud Rate | 19200 Baud |
| Data Bits | 8 |
| Stop Bits | 2 |
| Transfer Protocol | X_ON / X_OFF |

5.1 Printing, the Print Menu

When a data communication cable (Centronics, Serial) is connected, the machine displays the Print Menu. Data will be sent according to the selection to the a printer or to a PC.

Use the UP/DOWN arrow keys to switch between *Print all Protocols* and *Print Commission No.* and press ENTER to confirm your selection of a print mode.

The *Print all Protocols* mode causes all the report protocols stored in system memory to be printed off. The *Print Commission No.* mode leads the operator automatically to the next screen where the commission number to be printed is selected (see Display 26).

```
xxx PRINT MENU xxx
>Print all protocols
Print commission no
```

Display 25

If the *Print Commission No.* mode is selected in the Print Menu, the first available commission number is displayed. Use the UP/DOWN arrow keys to display one after the other the commission numbers stored in system memory. Select one of them and press ENTER to send the data from this commission only to the printer or PC.

```
Print commission no
+++++
+++++
```

Display 26

If the machine displays a “Printer not Ready” error message after you pressed ENTER, the printer has to be switched to on-line mode. Check for potentially damaged connections from the machine to the printer or the PC.

If you transfer the data to a PC, make sure to select the correct baud rate and interface type.



Depending on the printer used, make sure Auto Carriage Return and/or Auto Line Feed are enabled, if necessary, so as to print the reporting protocol in the correct format.

Info

6 Service and Repair Contact

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CERTIFICATE



The Certification Body
of TÜV Management Service GmbH

certifies that

HÜRNER
SCHWEISSTECHNIK

Hürner Schweißtechnik GmbH
Nieder - Ohmener Str.
D-35325 Mücke

has established and applies
a Quality Management System for

**Development, sale and manufacture of
welding devices used in pipeline construction applications,
as well as the development and the manufacture of
flow monitoring systems and engineering plastics**

An audit was performed, Report No. **70005562**

Proof has been furnished that the requirements
according to

ISO 9001: 2000

are fulfilled. The certificate is valid until **2007-01-18**

Certificate Registration No. **12 100 14555 TMS**

Munich, 2004-01-28



Certification Body
of TÜV Management Service GmbH
Unternehmensgruppe TÜV Süddeutschland
Riederstraße 66
D-80339 München



TGA-ZM-07-92

KONFORMITÄTSERKLÄRUNG**Declaration of Conformity****Déclaration de conformité**

Wir / We / Nous

HÜRNER Schweißtechnik
Nieder-Ohmener Str.
D-35325 Mücke-Atzenhain

erklären in alleiniger Verantwortung, dass das Produkt
declare under our sole responsibility that the product
déclarons sous notre seule responsabilité que le produit

CNC 2000 ECO-w

Heizelement-Stumpfschweißmaschine für die Verarbeitung von Kunststoffrohren und -formteilen
Heating element butt-welding machine for processing plastic pipes and fittings
Machine à souder bout-à-bout à élément chauffant pour l'assemblage des tubes et raccords en plastique,

auf die sich diese Erklärung bezieht, mit den folgenden Normen oder normativen Dokumenten
übereinstimmen

to which this declaration relates, are in conformity with the following standards or standardizing
documents

auxquels se réfère cette déclaration, sont conformes aux normes et documents de normalisation
suivants

CE-Konformität / CE Conformity / Conformité CE

EG Richtlinie 89/336 EWG

EG Niederspannungsrichtlinie 73/23 EWG

Andere Normen / Other Standards / Autres normes

EN 50081-1 Generic Emission Standard 03.93

EN 50082-1 Generic Immunity Standard 03.93

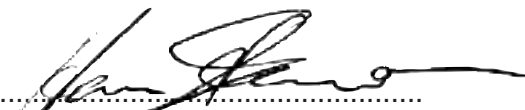
EN 60335-1 / IEC 335-1 1995

Bei einer nicht mit uns abgestimmten Änderung der Maschine oder einer Reparatur von Personen,
die nicht von uns im Hause geschult und autorisiert wurden, verliert diese Erklärung ihre Gültigkeit.
Any and all modifications of the device without our prior approval, and any repairs by persons who
were not trained and authorized by us, shall cause this declaration to become void.

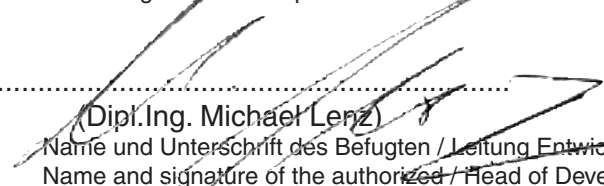
En cas de modification apportée à l'appareil sans notre accord préalable ainsi que de réparation
effectuée par des personnes non formées et agréées par nos soins, cette déclaration deviendra
caduque.

Mücke-Atzenhain
den 01.04.2005

(Ort und Datum)
(Place and date)
(Lieu et date)

.....

(Hans Strasser)

Name und Unterschrift des Befugten / Leitung Fertigung
Name and signature of the authorized / Head of Manufacture
Nom et signature du responsable / Direction de Fabrication

.....

(Dipl. Ing. Michael Lenz)
Name und Unterschrift des Befugten / Leitung Entwicklung
Name and signature of the authorized / Head of Development
Nom et signature du responsable / Direction de Développement